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*Student and teacher: Use this cover sheet for mailing or faxing.***PROJECT BOOKLET**MAT2038 Applied Mathematics 20
Module 7**FOR STUDENT USE ONLY**

Date Assignment Submitted:

(If label is missing or incorrect)

Student File Number:

Time Spent on Assignment:

Module Number: _____

FOR OFFICE USE ONLY

Assigned

Teacher: _____

Assignment

Grading: _____

Graded by: _____

Date Assignment Received:

**Student's Questions
and Comments****Apply Module Label Here****Name****Address****Postal Code***Please verify that preprinted label is for
correct course and module.***Teacher's Comments**_____
Teacher

INSTRUCTIONS FOR SUBMITTING THIS DISTANCE LEARNING PROJECT BOOKLET

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- Is the project completed? If not, explain why.
- Has your work been reread to ensure accuracy in spelling and details?
- Is the booklet cover filled out and the correct module label attached?

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Applied

Module

7

Mathematics 20

MEASUREMENT

PROJECT BOOKLET



Learning
Technologies
Branch

Alberta
LEARNING

FOR TEACHER'S USE ONLY

Summary

Total Possible Marks	Your Mark
40	

Teacher's Comments

Applied Mathematics 20
Module 7: Measurement
Project Booklet
Learning Technologies Branch
ISBN 0-7741-2053-3

Title page: PhotoDisc, Inc.

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	
General Public	
Other	



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- Alberta Learning, <http://www.learning.gov.ab.ca>
- Learning Technologies Branch, <http://www.learning.gov.ab.ca/lrb>
- Learning Resources Centre, <http://www.lrc.learning.gov.ab.ca>

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PROJECT BOOKLET

APPLIED MATHEMATICS 20: MODULE 7

Your mark for this module will be determined by how well you do on the module project in this Project Booklet and the module assignment in the Assignment Booklet.

The value of each part of the module project is stated in the left margin of this booklet. The total value of the module project is 40 marks.

Read all parts of this booklet carefully and record your answers in the appropriate place. Work slowly and carefully. If you are having difficulties, go back and review the appropriate activity in the Student Module Booklet.

Be sure to complete all parts of the project and proofread your responses before submitting this project to your teacher. If you require more room for any response, use your own paper and attach it securely to this booklet.

40

Module Project: Building a Giant Replica

Your project for Module 7: Measurement is Building a Giant Replica. This project involves researching theatre set design, constructing detailed drawings, and building a giant object that could be part of a set for a theatrical production.

You are to create a giant object of your own. The materials and methods you choose are up to you. Depending on the object, you might want to use materials like play dough, papier-mâché, clay, or styrofoam to build your giant replica.

The project will be graded in four areas, each worth 5 marks.

Sketch and Object	5 marks
Orthographic Drawing	5 marks
Giant Object (or Photographs)	5 marks
Report	<u>5 marks</u>
TOTAL	20 marks

The mark you receive out of 20 will be multiplied by 2 to make the project out of a total of 40 marks.

To assist you in preparing the materials to be sent in for this project, the following checklists show what should be included for each part of the project.

5

1. Sketch and Object

Does your sketch show the following?

- ☐ the original object
- ☐ significant features of the original object
- ☐ the measurements of the original object
e.g., 3.1 cm
- ☐ the precision of the measurements
e.g., (3.1 ± 0.05) cm

Which of the following are you submitting?

- ☐ the original object
- ☐ photographs of the original object with a ruler placed beside it

⑤

2. Orthographic Drawing

- ☐ The scale is stated explicitly.
- ☐ The measurements are clearly stated.
- ☐ The tolerance of each measurement is stated.
- ☐ Solid lines are used for all outside edges.
- ☐ Broken lines are used for all internal features.
- ☐ Broken lines are used to show how different views are aligned.
- ☐ All needed views are included.
- ☐ The drawing is clear, concise, and complete.

⑤

3. Giant Object (or Photographs)

- ☐ The measurements are correctly to scale.
- ☐ The measurements are within tolerances.
- ☐ The colour is used where possible.
- ☐ The details are accurate.
- ☐ The giant object is constructed carefully.

You may submit the giant object you have created, or you may submit photographs of the giant object.

If you choose to submit photographs, include a ruler next to the object in each photograph so the size can be judged. Also, show the object in the same positions as your orthographic drawing.

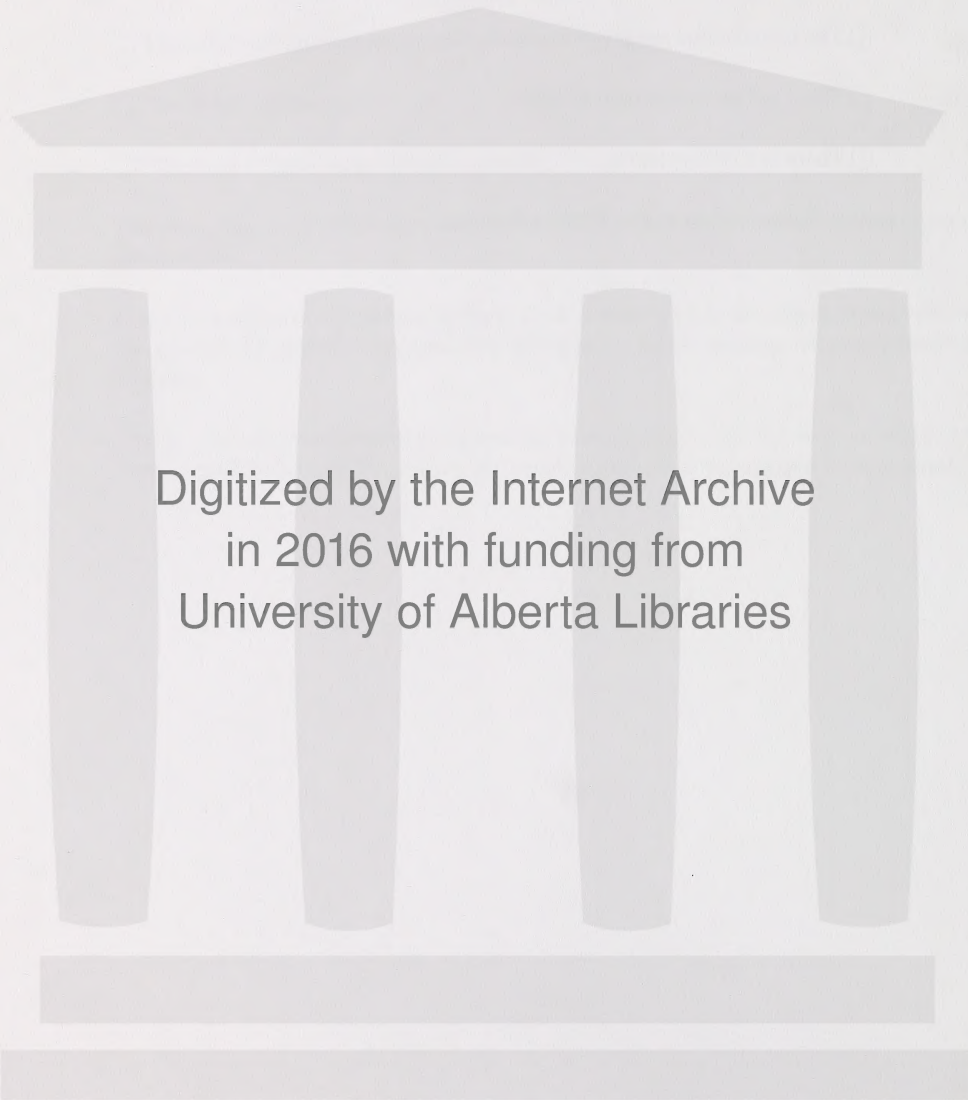
Finally, include another photograph of the giant object beside the original object so the scale is clear and the special features of the original and giant objects can be compared.

⑤

4. Report

- ☐ A clear description of the process used in building the model is included.
- ☐ The reasons for using the scale chosen are given.
- ☐ The calculations are given in detail.
- ☐ There are no mathematical errors.
- ☐ There is a bibliography.

Attach your report to this Project Booklet.



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ASSIGNMENT BOOKLET

MAT2038 Applied Mathematics 20
Module 7

FOR STUDENT USE ONLY

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Teacher's Comments

Teacher

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- Are all the assignments completed? If not, explain why.
- Has your work been reread to ensure accuracy in spelling and details?
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Applied

Mathematics 20

Module

7

MEASUREMENT

ASSIGNMENT BOOKLET



Learning
Technologies
Branch

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LEARNING

FOR TEACHER'S USE ONLY

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Applied Mathematics 20
Module 7: Measurement
Assignment Booklet
Learning Technologies Branch
ISBN 0-7741-2052-5

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ASSIGNMENT BOOKLET

APPLIED MATHEMATICS 20: MODULE 7

Your mark for this module will be determined by how well you do on the module assignment in this Assignment Booklet and the module project in the Project Booklet.

The value of each part of the module assignment is stated in the left margin of this booklet. The total value of the module assignment is 60 marks.

Read all parts of this booklet carefully and record your answers in the appropriate place. Work slowly and carefully. If you are having difficulties, go back and review the appropriate activity in the Student Module Booklet.

Be sure to complete all parts of the assignment and proofread your responses before submitting this assignment to your teacher.

60

Module Assignment

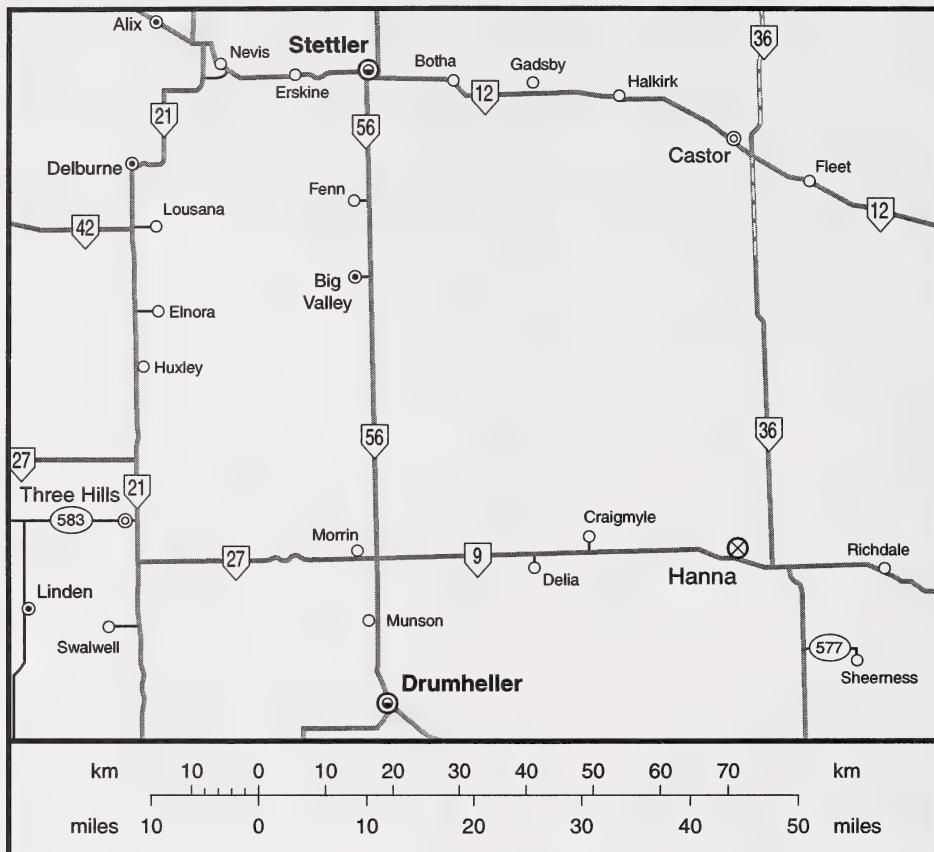
6

1. Complete the following chart of scales by changing the form given into the other two forms.

Ratio	Rate	Statement
1:50		
		25 cm represents 10 m
	$\frac{13 \text{ cm}}{50 \text{ cm}}$	

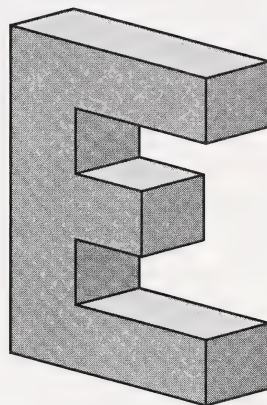
5

2. Using the map and major highways only, determine the distance travelled to visit Stettler, Castor, Hanna, and Three Hills on a day trip starting from and ending in Drumheller. Make the trip as short as possible.



⑥

3. Create an orthographic drawing of the three-dimensional letter E.



4. For each pair of measurements, determine the sum and quote the appropriate uncertainty.

②

a. $(4.260 \pm 0.005) \text{ cm} + (9.040 \pm 0.005) \text{ cm}$

②

b. $(9.80 \pm 0.05) \text{ mL} + (7.40 \pm 0.05) \text{ mL}$

⑤

5. Find the perimeter of a 41-sided polygon with 40 sides measuring $(4.1 \pm 0.05) \text{ cm}$ and 1 side measuring $(4 \pm 0.5) \text{ cm}$. Report your answer using the appropriate precision and uncertainty.

6. For each pair of measurements, determine the difference and quote the appropriate uncertainty.

②

a. $(101.80 \pm 0.05) \text{ m} - (90.00 \pm 0.05) \text{ m}$

②

b. $(-14.20 \pm 0.05)^\circ\text{C} - (-18.00 \pm 0.05)^\circ\text{C}$

- ⑤ 7. A triangle has a height of (17.50 ± 0.05) cm and a base of (11.20 ± 0.05) cm. What are the maximum and minimum possible areas of this triangle? What is the area of this triangle and the percentage error associated with this area?

5

8. A cylinder has a volume of $1000 \text{ cm}^3 \pm 2.0\%$ and a height of $100 \text{ cm} \pm 1\%$. What is the radius of the cylinder? Report your answer with the appropriate percentage error.

- ⑤ 9. If a person is overweight or underweight, it will increase their health risks. A body mass index (BMI) between 25.0 kg/m^2 and 29.9 kg/m^2 indicates that a person is overweight. The BMI is calculated as follows:

$$\text{BMI} = \frac{\text{Weight (in kg)}}{[\text{Height (in m)}]^2}$$

If a person weighs $(71 \pm 0.5) \text{ kg}$ and has a height of $(1.72 \pm 0.05) \text{ m}$, is it possible that this person is overweight? Include the necessary calculations to support your answer.

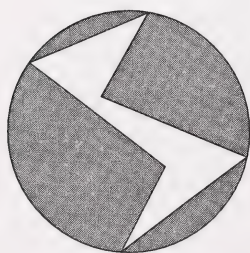
⑤

10. How many significant digits do each of the following measurements have? State your reason in the appropriate column.

Measurement	Number of Significant Digits	Reason
3.10 cm		
290 m		
207 kg		
0.0029 g		
$\$(400\,000 \pm 10\,000)$		

⑤

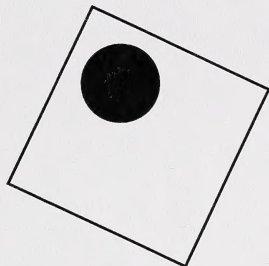
11. Create a scale drawing of the following image using a scale factor of 200%.



12. A designer specified a part as a square, with each side measuring (3.0 ± 0.05) cm, with a circular hole of diameter (1.2 ± 0.05) cm centred in the square. Each of the following was rejected. Give a brief explanation as to why each part was rejected.

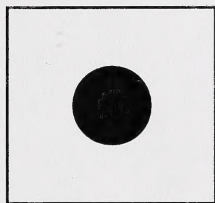
①

a.



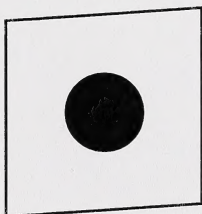
①

b.



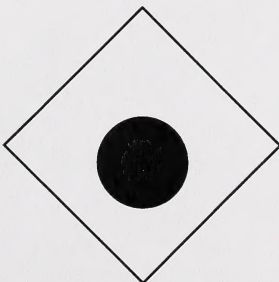
①

c.



①

d.



①

e.

